HOGAN & HARTSON
L.L.P.

LAWRENCE V. BROCCHINI
PARTNER
(212) 918-8275
LBROCCHINI@HHLAW.COM

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875 THIRD AVENUE
NEW YORK, NEW YORK 10022
TEL (212) 918-3000
FAX (212) 918-3100
WWW.HHLAW.COM

BY EMAIL

Leland W. Hutchinson, Jr.
Freeborn & Peters LLP
311 South Wacker Drive, Suite 3000
Chicago, Illinois 60606-6677

Re: *Symbol Technologies, Inc. v. Intermec Technologies Corp.* – W.D. Wisconsin

Dear Mr. Hutchinson:

We write as required under the scheduling order to discuss the serious deficiencies in Intermec's Response to Symbol Technologies, Inc.'s First Set of Interrogatories ("Interrogatory Responses") and Intermec's Responses to Symbol Technologies, Inc.'s First Set of Requests for Production [Sic] and Things ("Document Responses"). We are available to further discuss these issues in an attempt to resolve or narrow them.

INTERROGATORY RESPONSES

Interrogatory Nos. 1, 3 and 4 – PDF417

Intermec expressly (and improperly) limited its response to Interrogatory No. 1 to "Intermec products [that] can be configured with an integrated scanner option capable of reading and/or decoding the symbology known as PDF417." Apart from the fact that the term "integrated scanner option" is ambiguous and does not address the type (or manufacturer) of the scan engine used, as required, it appears that Intermec listed only products that read PDF417 and have a laser scan engine, while omitting devices that use imaging scan engines, such as, for example, the Intermec ScanImage 1407B and CK30. The interrogatory, however, calls for more than what Intermec now calls "scanners," requiring Intermec to identify each Intermec "bar code reading device or system . . . that is capable of reading and/or decoding the symbology known as PDF417. . . ." This includes single line imaging scanners and two-dimensional imaging scanners as

well. Intermec's unilateral rewriting of the interrogatory to avoid providing relevant and responsive data is improper.

Likewise, Intermec's statement in its response to Interrogatory No. 4 that it "believes that all scanning products produced by it that are capable of reading and/or decoding PDF417 incorporate scan engines which were purchased from Symbol" is clearly incorrect. Intermec sells various devices that use linear and 2D imaging scan engines and which will read and decode PDF417. As explained in our letter of June 21, responding to your letter of June 16, the claims of the '655 and '308 patents in suit are not limited to devices that use a scanning laser or any particular type of bar code reader technology. Intermec makes, uses, sells, and offers for sale bar code readers including, *inter alia*, single line imaging scanners and two-dimensional imaging scanners, which decode PDF417 and/or RSS and which use engines not provided by Symbol. This and the next interrogatory require Intermec to identify all such products.

It may be that Intermec has taken the litigation position that only laser scanners, and not imagers, can perform a "scan operation," and is relying on this to provide a basis for its responses. We note that this view is squarely at odds with Intermec's pre-litigation position. For example, Intermec's publicly-available literature acknowledges that its imagers, such as the Intermec ScanImage 1470B, can "scan," and refers to them as "scanners" or "image scanners." *See, e.g.*, Intermec Nov. 12, 2001 Press Release, *Intermec's Fastest 2D Symbology Scanner Now Offers Even More*, available at http://www.intermec.com/eprise/main/Intermec/Content/About/NewsPages/pressRelease?section=about&pressID=333 ("Nov. 2001 Intermec Scan Image Press Release") (describing, for example, the imager as a "scanner"; referring to the imager as useable in "repetitive, high volume hand-scanning operations," "in applications requiring omni-directional scanning capabilities" or in "scanning of portable data files"); Intermec website – Product: ScanImage 1470B, http://www.intermec.com/eprise/main/Intermec/Content/Products/Products_ShowDetail?section=Products&Product=1470B ("A scanning range of up to 9 inches of linear bar codes, ergonomic design, and a new intuitive, bright, sharp scan line make the ScanImage 1470B extremely user friendly"); Intermec White Paper, *Guide to Scanning Technologies* (identifying linear imager as "scanner"; noting faster "scan rates" for "linear image scanners"; comparing scan time and scan range between lasers and linear imagers; defining a "linear imager" as a solid state scanner using a CCD as underlying technology). For your convenience, a copy of these and other referenced Intermec public information is attached. In any event, assuming

Intermec is now seeking to change its view, that newly-minted non-infringement argument is just that – an argument – which Symbol disputes and which doesn't operate to relieve Intermec of its obligation to produce proper discovery.

In light of the foregoing, we ask that Intermec identify all Intermec products that read and/or decode PDF417, as requested in Interrogatory No. 1, provide the information regarding any additional products requested by Interrogatory No. 3, and address all of Intermec's PDF417 readers in response to Interrogatory No. 4. Additionally, for all the bar code readers – laser scanners or imagers – please identify, as requested (in Interrogatory No. 1 and Interrogatory No. 2 for RSS) the type and manufacturer – be it Symbol or someone else – of the scan engine used.

Interrogatory Nos. 2 and 3 – RSS

Intermec's refusal to identify its products capable of reading and decoding RSS because of some purported confusion as to the meaning of RSS is, frankly, frivolous. RSS is a well-known bar code symbology developed by EAN International and the Uniform Code Council Inc. (now GS1 and GS1 US, respectively) and recognized by the Association of Automatic Identification and Mobility ("AIM"). Indeed, an Intermec employee identified by Intermec in both its initial disclosures and response to Interrogatory No. 3, Sprague Ackley, was a member of the AIM Technical Symbology Committee during the review process that led up to publication of the AIM symbology specification for RSS in 1999. The published standards for the RSS Symbology are readily available on AIM's website (www.aimglobal.org/standards/symboinfo/rss_overivew.asp).

Your client, moreover, has no difficulty identifying for marketing purposes which of its products read and/or decode RSS. *See, e.g.*, Nov. 2001 ScanImage 1470B Press Release ("The ScanImage 1470B reads a wide variety of symbologies," including RSS); July 3, 2002 Intermec Press Releases, available at http://www.intermec/com/eprise/main/Intermec/Content/About/NewsPages/pressRelease?section=about&pressID=387 (Intermec "today announced that its popular ScanPlus 1800 family of scanners now support Reduced Space Symbology®, or RSS, bar codes"; describing a high level summary of the different types of RSS codes); Intermec website – Product: ScanPlus Vista 1802 cordless, http://www.intermec.com/eprise/main/Intermec/Content/Products/Products_ShowDetail?section=Products&Product=SCAN1802VT ("PDF 417 decoding with manual

raster, and new Reduced Space Symbology (RSS) decoding"). RSS is, therefore, well defined and understood by the industry and your client.

Next, your objection based on the fact that discovery has just begun (for this and all other interrogatories as well) is equally unfounded; Intermec itself knows the capability of its products and needs no discovery before it can tell Symbol which products do and do not read/decode RSS.

Please provide us with an identification of Intermec products capable of reading and decoding RSS immediately, along with an identification of the scan engine used and the information called for in Interrogatory No. 3 regarding such products.

Interrogatory No. 4 – Alleged Non-infringement

Please provide the requested basis for Intermec's "belief" that its products do not practice any of the claimed inventions of the '308 Patent. Additionally, with respect to the '655 Patent, if Intermec contends that its bar code reading devices and systems, including imagers as well as scanners, not using Symbol's scan engines do not infringe the '655 Patent, please provide the basis for that contention as well.

Interrogatory No. 5 – Invalidity/Unenforceability

Intermec's response to Interrogatory No. 5 that "the Asserted Claims for Symbol's '655 Patent are invalid and/or unenforceable on the basis of obviousness," tells us nothing more than what we knew from Intermec's answer. As requested, please provide the specific basis for that position, including any and all facts, including prior art, and an identification of documents and persons with knowledge concerning that contention. We take it from your response that Intermec does not contend that the Asserted Claims of the '308 Patent are invalid or that the '308 Patent is unenforceable.

Interrogatory No. 6 – Intermec's Knowledge of the Symbol Patents

In seeking information regarding Intermec's knowledge of the Symbol Patents, Interrogatory No. 6 on its face requests information within Intermec's

possession, custody and control. Objection to this interrogatory based on the stage of fact discovery is not well grounded. Please provide this information immediately.

Interrogatory No. 7 – Willfulness

Like its response to Interrogatory No. 5, Intermec's response to Interrogatory No. 7 provides no basis for Intermec's contention (beyond its contention that it does not infringe) that it does not willfully infringe. Please provide the requested information.

Interrogatory No. 8 – Identification of opinions of counsel

Interrogatory No. 7 asking Intermec to identify any opinions of counsel it has obtained is directed to information exclusively within Intermec's knowledge. Logically, your offer to provide an amended response identifying opinions of counsel when Intermec "becomes aware" of the information, implies that Intermec has not obtained – and therefore has not relied upon – opinions of counsel, and therefore cannot assert advice of counsel as a defense to Symbol's willful infringement claims. Either Intermec knows about and relied upon advice of counsel, or it didn't. Please tell us which it is, and provide the other requested information.

RESPONSES TO DOCUMENT REQUESTS

Intermec's refusal to provide documents responsive to 58 separate requests for production (out of 68 total) based on its continued assertion that Symbol has not identified products at issue is unfounded, particularly in light of our June 21 letter and additional discussion above. We assume that our June 21 letter – which was sent while your responses were in transit to us – clears up this matter. Please let us know if this is not the case and you intend to press this litigation position. If not, we will assume that you have withdrawn your purported "meet and confer" objections to each of the document requests and will produce documents.

Finally, you indicate that Intermec will be producing documents it has agreed to produce on a "rolling basis." Please let us know when we can expect the first production and what time frame you contemplate for completing the balance of Intermec's production (including documents called for by the additional 58 requests). As you know, we have a firm trial date in May 2006, and, accordingly, we need some assurance that document production will be completed in sufficient time to allow

Symbol to conduct other discovery and comply with the other court-imposed deadlines (*e.g.*, expert disclosure; dispositive motions).

Hopefully we can resolve these issues without taking up the Court's time. We are available to discuss these issues, and look forward to hearing from you.

Sincerely,

Lawrence Brocchini

cc: Shane Brunner, Esq.
Eugenia C. Carter, Esq.

Intermec

Intermec's Fastest 2D Symbology Scanner Now Offers Even More

ScanImage 1470B imager captures photo plus bar codes for positive identification in security, inventory applications

EVERETT, Wash., Nov. 12, 2001 Intermec Technologies Corp. s ScanImage 1470B handheld imager, an upgrade of the 1470, now offers omni-directional decoding of two-dimensional symbologies, linear barcodes, and OCR fonts, plus an ability to capture photo images for security and other applications.

Lightweight and ergonomically designed for better balance in the user s hand, the 1470B can be used in repetitive, high-volume hand-scanning operations in even the most demanding environments. The imager provides fast performance in applications requiring omni-directional scanning capabilities, 2D symbols as small as 6.6 mil Data Matrix codes, or scanning of portable data files contained within a symbol.

The 1470B also can read low-contrast Direct Part Marks, such as 6.6 mil Data Matrix codes, which are created using dot-peen, laser-etch, and chem-etch processes that may result in contrast ratios as low as 30 percent.

For applications requiring mixed symbologies on a single label, the 1470B can be configured to read more than one within its field of view, reducing the repetitive motion of reading symbols one at a time. The depth of field for the 1470 has increased from the nose of the imager out to seven inches. The solid-state technology of the imager uses no moving parts, offering up to 100 times greater reliability than a comparable laser scanner.

With a single-position trigger, the 1470B s LED illuminates the bar code, and the bright aiming line activates until the symbol is successfully scanned or the operator releases the trigger, making it easy for users to gauge the right depth of field for a given symbol s size and density.

This imager is packed with more powerful features than earlier models to capture and decode two-dimensional symbologies in record speed, said Steven McDonald, Intermec product manager. The 1470B features advanced power management to extend battery life when connected to a portable data terminal, plus greater reliability and sleek task-oriented design ensure a positive return on investment.

The ScanImage 1470B reads a wide variety of symbologies, including linear codes (Code 39, Interleaved 2 of 5, Code 128, ISBT-128, Codabar, Code93, UPC/EAN, Codablock), stacked linear symbology (PDF417, Micro PDF417, TLC39, RSS), matrix/2D codes (Data Matrix, MaxiCode, QR Code, Aztec, Aztec Mesa, Code 49, UCC Composite), postal codes (U.S. Postnet, BPO4 State, Canadian State, Japanese Post, KIX Dutch Post, Planet Code) and OCR Fonts (OCR-A, OCR-B, U.S. Currency Serial Number).

For fast configuration and set up, the ScanImage 1470B includes Intermec s Quickview"! software. With it, users can upload software updates, as well as generate configuration bar codes to clone multiple units. Image capture also is available via Quickview should the application require a photo depicting a physical description of an object, person or signature.

The ScanImage 1470B is available in two versions: standard and high density, which reads bar codes whose bars are extremely close together.

About Intermec
Intermec Technologies Corp., a UNOVA Inc. (NYSE:UNA) company, is a leader in global supply

chain solutions and in the development, manufacture and integration of wired and wireless automated data collection, Intellitag® RFID (radio frequency identification), mobile computing systems, bar code printers and label media. The company s products and services are used by customers in many industries to improve productivity, quality and responsiveness of business operations, from supply chain management and enterprise resource planning to field sales and service.

To learn more about how companies can benefit from Intermec s supply chain technologies, contact Intermec Technologies Corp., 6001 36th Ave. West, P.O. Box 4280, Everett, WA 98203-9280 USA; telephone 800-347-2636; or visit Intermec's web site at www.intermec.com. To learn more about UNOVA, visit www.unova.com.

ScanImage™ 1470B

How to Buy

Specifications | PDF | Return to Product List

- Full omni-directional 2D Image Reader with image capture technology
- Captures data at a high-speed 30 frames per second
- Reads all popular 2D and linear symbologies
- Free Quick*View software and Visual*Menu configuration utility makes initial setup a snap!

Intermec is proud to offer the ScanImage 1470B imager. Strides beyond our previous imager offerings, the ScanImage 1470B comes packed with powerful features.

Rightly suited for a wide spectrum of industries, the ScanImage 1470B imager is ideal for warehouse and distribution, retail, packaging, printed circuit board manufacturing and healthcare/clinical applications—essentially anywhere omnidirectional and/or 2D imaging is required.

The ScanImage 1470B seizes data at a high-speed 30 frames per second. A scanning range of up to 9 inches on linear bar codes, ergonomic design, and a new intuitive, bright, sharp scan line make the ScanImage 1470B extremely user friendly.

What's more, exceptional durability combined with low power consumption makes the ScanImage 1470B an excellent choice for portable data collection in warehouse, manufacturing, and distribution applications.

Setting up the ScanImage 1470B is a snap with Visual*Menu – a software utility for quick and easy configuration. There's no need to page through thick manuals to turn on/off features required for your application. With a point and click you can instantaneously configure your imager to meet the needs of your application. Even better, every ScanImage 1470B imager comes with Quick*View and Visual*Menu configuration software free of charge.

Ease, comfort and performance, the ScanImage 1470B is the easy choice for your imaging solution.

Intermec

White Paper

GUIDE TO SCANNING TECHNOLOGIES

TABLE OF CONTENTS

REVISED 2ND EDITION

INTRODUCTION

Scanning technology has been changing dramatically. Laser scan engines, once considered the workhorses for most scanning applications, have been surpassed by new imaging scan engines — linear imagers and 2D imagers — that are more powerful and reliable. It has also enabled the convergence of scan engines into a wider variety of devices.

When the question arises as to which technology is best in handheld scanners, the debate polarizes. The laser camp will argue "it's a laser so it must be better," where as imaging advocates tout its unmatched reliability, versatility and value.

In reality, all scanning technologies are exceptionally good at what they do, as long as they're used in the correct environment for the proper application. Both laser and imaging technologies have been around for many years and continue to improve, although recent advances in imaging technology, which make it superior in reading many types of bar codes, have changed the playing field considerably.

The question then arises: "How do I choose the best scanner for my application?" This guide is designed to help you do just that. As a leader in barcode technologies as well as emerging data collection technologies such as RFID, Intermec is uniquely positioned to guide you through technical information and different scanning applications so you will be able to make informed choices about what will work best for you.

LINEAR IMAGERS

The underlying technology of a linear imager is called a charge-coupled-device (CCD). These solid state components are found in a wide variety of products from simple scanners and image capture devices, such as fax machines, to highly sophisticated devices, like linear imagers, video cameras, and digital cameras. In a linear imager, the CCD captures different levels of reflected light from a bar code's bars and spaces and converts them into a video signal.

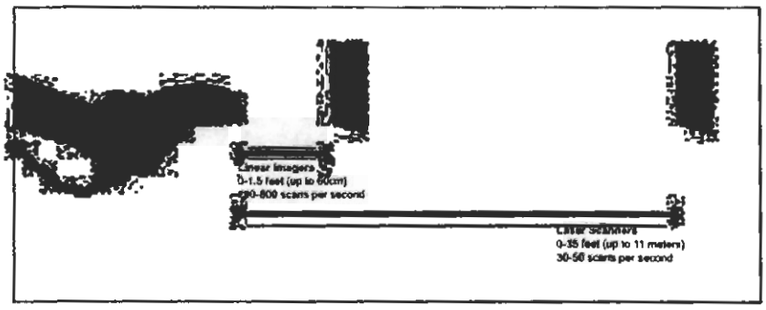
For optimum performance, linear imagers need their own light source, which is provided by low-power, long-life LEDs (light emitting diodes). Their low power consumption and long life means that the light can be on all the time, eliminating the need for a trigger, although some scanners do incorporate triggers and sleep/wake modes for power saving, especially when connected to battery operated devices.

Since linear imagers are solid state they are inherently more reliable than laser scanners, which use fast-moving mirrors to move a beam across the bar code. To read a bar code, a linear imager illuminates it with light from the LED and uses a lens to focus the image of the bar code onto the CCD component. The simplest reading process identifies the peaks and troughs in the signal and applies one or a number of decode algorithms to get the bar code data. This is done by the scanner's analog-to-digital converter and by software running on the processor. The speed of the processor and efficiency of the software largely determine how fast this happens and how "snappy" the scanner feels to the user.

While linear imaging capability has been around for many years, recent advances in the technology have dramatically improved the performance of this type of scanner. Manufacturers of these next-generation linear imagers have developed advanced ways of reading the video signal and special decode hardware/software to improve speed, depth-of-field and read success rates. These refinements, coupled with faster scan rates (up to 5-10 times faster than a laser scanner) and faster processors, help explain why linear imager scanners are better or snappier than others when it comes to reading poor quality or laminated bar codes.

LASER SCANNERS

Laser scanners read bar codes with a laser beam in conjunction with oscillating mirrors to automatically move the beam back and forth across a bar code. Laser engines come in a variety of configurations (e.g. standard range, wide angle, high density, long range and high visibility) to meet the needs of different scanning applications. The major advantage to lasers is their scan range; they can read bar codes from several feet away. In fact, if the symbol is printed large enough, the laser can read it from as far away as 35 feet (11 meters). For applications such as scanning from a forklift in a warehouse, the ability to read a bar code without having to constantly get off the forklift is a distinct advantage.



Linear imagers scan most effectively at shorter distances, but scan at a much higher rate of speed. Lasers are ideal for long-range scanning applications.

Another advantage of lasers is that they can be focused to a very small beam. Because the light is coherent (a single frequency), the beam will not spread much over a given distance. Therefore the diameter of the beam will remain small enough to resolve the wide and narrow bars of the bar code even if the reading distance varies. That property allows laser scanners to read bar codes over a wide scan range.

On the downside, lasers tend to be more expensive than linear imagers and have a moving part, the oscillating mirror, which over time can get out of alignment and degrade scanning performance. Laser safety is also an issue, especially in Europe where concern over high-energy lasers hitting the eyes is already a hot topic of discussion. In the U.S., the move to bring scanners into the home for e-commerce applications is raising the question of laser safety around children.

Laser scanners and linear imagers include handheld or fixed position models. Handheld units generally operate at the lower end of scanning speeds (35-300 times a second) because the symbol being scanned is usually stationary. Fixed position scanners on a conveyor operate at the higher end (600-1800 times a second) to be fast enough to read the label before it moves past the scanning area.

PERFORMANCE BENCHMARKS

Intermec's labs have conducted extensive tests over a variety of brands of handheld laser and linear imaging scanners to determine performance characteristics. The data from these key benchmarks illustrates the strengths and weaknesses of each technology.

In general, the most expensive laser scanner and the higher quality linear imagers did well in virtually every category, so the scanner purchase decision must balance price, performance, and specific application needs.

Beam Brightness

Lasers are the clear leader in beam brightness and coherency. Linear imagers' beam brightness is very good within typical scanning range (2-18 inches/40mm-480mm), but tends to diffuse at longer ranges.

Scan Time ("Snappiness")

Scan time tests involved measuring the time a scanner takes to read real-world, poor quality labels — the most effective test for evaluating what the customer experience will be.

Linear imagers and the top-of-the-line laser did significantly better — up to 91 seconds faster than other laser scanners.

Scan Range (depth of field)

Lasers, specifically long range lasers, can scan at a greater distance, but have difficulty scanning at close range. Linear imagers have a better overall read range, especially on 2.5 mil Code 39 bar codes.

For larger codes (55–100 mil) at a greater distance, long range lasers are the only option.

Substitution Resistance

This tests the scanner's propensity to substitute characters when it can't read the barcode — in other words, how well does it resist substituting bad data. Scans are taken over various distances, as substitution tends to occur more often at longer scan ranges.

In the test, only linear imagers did not generate any substitutions.

Decodability

A decodability test determines the scanner's ability to read extremely poor quality and damaged codes, including bar codes under several layers of clear plastic wrap.

Both the most expensive laser and the higher quality linear imagers performed well on virtually all poor quality and overlaminate codes and read low contrast codes down to 20-25%.

CONSIDERATIONS FOR SELECTING A SCANNER

For applications requiring scanning of linear bar codes, both lasers and the linear imagers are excellent technologies and while there are some overlaps in their appropriate applications, each technology has characteristics that make it better for specific uses.

The criteria used to decide which technology to use — or how to mix the technologies within your enterprise — should be based on the scanning application (from what distances will scans be made, what is the condition of the bar codes being scanned, what is the work environment, etc.) as well as price/performance considerations.

The chart below summarizes the characteristics of the most recent generation of linear imaging and laser scanning technologies:

Scanning distance less than 18 inches (45cm)	✓	
Scanning distance up to 35 feet (11 meters)		✓
Higher bar code densities	✓	requires special scan engine
Poor quality/damaged bar codes	✓	
Over-laminated bar codes	✓	
Linear bar code labels	✓	✓
2D stacked bar codes — PDF 417, Code 49 (requires special software)	✓	requires special scan engine
Matrix codes (Datamatrix, QR code)	(see "Other Scanning Technologies")	
Reliability	✓	
Scan rate: 30-50 scans per second		✓
Scan rate: 200-800 scans per second	✓	Fixed position only
Very bright spotting and scanning beam		✓
Fast scanning in fixed positions	✓	✓
Retail Price (with cable): US$150 - $700	✓	
Retail Price (with cable): US$500 - $2000		✓

What is the reading distance and item to be scanned?

Linear imagers work exceptionally well at standard range of less than 18 inches (45cm), so if the scanner can be brought close to the label (or vice versa), a linear imager would be a good choice. However, if the labels are more than 18 inches (45cm) away, laser scanners are the best option.

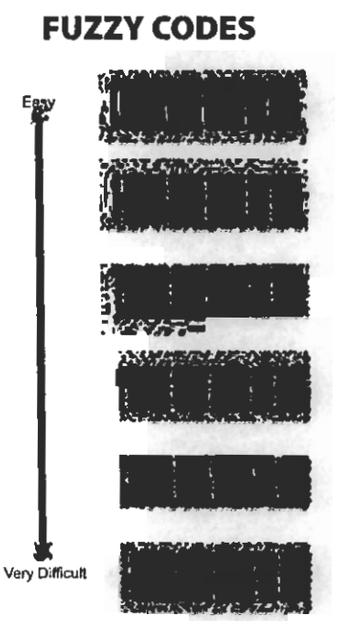
What type of code will be used?

Most scanning technologies read the same common set of bar code symbologies, including EAN/UPC, Code 39, and Code 128. The latest generations of linear imagers work best on these codes at higher code densities, in the region of X-dimensions (narrow bar width) between 2 and 5 mil (0.05 and .1mm) and with code widths up to 8 inches (200 mm) for X-dimensions between 10 and 20 mil (0.25 mm and 0.5mm).

What is the condition or source of the bar code?
Linear imagers are not only excellent at higher densities; they also read poor quality codes and bar codes through laminates exceptionally well. Generally, linear imagers can read codes with low contrast between bars and spaces (caused by the color or poor printing/fading). Some linear imagers can also cope well with damaged codes. The faster scan rate of linear imaging engines plays a significant role in reading these, as do the methods used to decode the complex video signal information provided by the linear imager. This is, in turn, dependent on the investment the supplier has made in decoding techniques.

Test your scanner
Linear Imagers can read very poor quality bar codes that lasers can't.

What are the environmental conditions?
Linear imagers are solid state without any moving parts. Because of that, they tend to be more reliable than lasers, which use moving mirrors to make a laser spot travel across a code. However, it's the casing of the scanner that dictates its suitability for certain environments. In retail, for example, a linear imager in a standard ABS plastic case will provide a durable, long-life solution, whereas a more durable casing would be needed for the same scanner in a warehouse or industrial application.



Do you need to read bar codes off computer screens?
One unique application for linear imagers is reading bar codes off computer screens. This is extremely helpful in configuring the devices via bar codes, especially if you have a large number of devices to configure. Instead of printing out a series of bar codes, you simply display them on a computer monitor and scan them directly.

How important is performance?
If a scanner, regardless of its technology, reads a code, then the performance differences between it and another will be judged on issues like "snappiness", scan range and definition of reading zone. Within its scan range, a linear imager can provide exceptional performance. Scan rates of 100 scans per second are common and top-of-the-line scanners offer up to 800 scans per second.

Some linear imagers are contact readers and will only read if the scanner's nose is touching the code. This is appropriate for flat surfaces, but can give problems if the code is on a curved surface. Long-range linear imagers are better for curved surface scans. Other linear imagers can read out to 2 inches (40 or 50 mm) while extended or "long" range linear imagers, like Intermec's ScanPlus 1800 Vista, can read up to 18 inches (460mm).

As the reading distance increases, it becomes more important to know where the scan line is. With laser scanners this is clearly marked by the laser line, but linear imagers depend on the illumination of the LEDs. As a result, the scan line for linear imagers becomes more difficult to see as the reading distance increases or in high ambient light conditions such as direct sunlight.

How much do I want to pay?
Linear imagers are generally less expensive than lasers. With U.S. retail prices between $150 and $700, linear imagers are easy to justify. However, the range in price is still quite wide (and even wider with lasers), which can be an issue for some buyers, particularly when high volumes are being considered. If price is an issue, take care not to compromise on the following features, particularly if the purchase is intended to improve productivity.

1. Is the scanner's scan range suited to the application? Is there a "comfort zone" (scan range on the actual code of at least 0.4 inches/1cm) to make reading intuitive and allow curved labels to be read? Does the user need to see the scan line on the bar code?

2. Is the resolution range of the scanner suitable for the application? The scanner should read the codes with some comfort zone.

3. Does the scanner read all the possible qualities of code the application will present?

4. Is the scanner easy and comfortable to use? Can it be picked up and set back down easily? Is the scanning plane and zone suitable for the operator's position and placement of the coded items? If the scanner has a trigger, is it easy to use?

5. If an extended scan range is necessary, does the scanner have adequate scan depth on the actual codes?

6. Does the scanner read all codes easily or does it take time to read? A good test is to check the time it takes to read 10 or 20 real-world codes rather than just testing on one sample.

7. Is the scanner suitable for the environment, i.e. ruggedness, style, cable strength and length, sealing against water, dust and vibration, ambient light, temperature, etc.?

8. Check that the most obvious requirements are actually met, including symbology type, data formatting needs, etc.

OTHER SCANNING TECHNOLOGIES

APS CMOS Sensors

Active Pixel CMOS Sensors (APS), like Intermec's EV10 scan engine, are a new form sensor that replaces the CCD used in many of today's linear imagers. The new APS sensor combines the light detector and the digital signal processor all into one ASIC. This new APS sensor allows for linear imagers to have the same performance as those that used CCD sensors but these new linear imagers are smaller, lower power, more reliable, and offer many other advantages over conventional CCD based linear imagers.

2D Image Readers

2D imagers capture a "picture" of two-dimensional or linear codes and process them using advance decode algorithms. For linear codes, 2D imagers provide omnidirectional reading of linear bar codes, so orientating the code for scanning is unnecessary.

2D codes carry much more information in a smaller space than linear bar codes, making them ideal for applications like printed circuit board manufacturing, healthcare/clinical and retail.

2D imagers can be produced using either CCD technology or the more sophisticated CMOS technology, which uses dramatically less power while providing advanced performance. CMOS-based 2D imagers are ideal for applications where changing or recharging batteries in mid-shift reduces productivity, like portable data collection in warehouse, manufacturing, and distribution applications.

For more detailed information on 2D imaging, read the whitepaper *Sizing Applications for 2D Symbols* available at www.intermec.com (go to the "About" navigation and then "whitepapers").

RFID

Radio Frequency IDentification is similar in concept to bar coding, but instead of a printed label with static information that requires line-of-sight scanning, RFID tags contain an application-specific integrated circuit (ASIC). The ASIC acts as a dynamic portable database that can be read and/or written to every step along the supply chain. RFID does not require line of sight to read tags, speeding the process of data collection and RFID devices, such as a tag or label, which can be attached to virtually anything – from a vehicle to a pallet of merchandise. In addition, because the technology is difficult to counterfeit, RFID provides a high level of security.

RFID is currently a complementary technology to bar codes, but has the potential to replace them in certain supply chain applications. In the short term, combination bar codes scanners/RFID interrogators, like the Intermec 1555, allows workers to work with both technologies using one device.

INTERMEC TECHNOLOGIES' SCANNING SOLUTIONS

Intermec offers a full range of linear imagers, CMOS-based 2D imagers, laser scanners, scan engines and RFID interrogators to meet virtually every application requirement along the supply chain. From industrial to retail to healthcare applications, Intermec has a product designed specifically to meet virtually every environmental, scanning and ergonomic need.

For more information on Intermec scanning solutions, contact Intermec Technologies Corp. at 1-800-347-2636 or visit Intermec's Web site at www.intermec.com.

GLOSSARY OF TERMS

APS
Active Pixel Sensors often fabricated using Complimentary Metal Oxide Semiconductor (CMOS) technology. APS enables individual pixels on the sensors to be programmed, making it easier to read a variety of different symbologies from the same device.

Bar Code Symbol
A sequence of rectangular shapes and intervening spaces used to encode a string of data. A bar code symbol typically consists of five parts: 1-a leading quiet zone, 2-a start character, 3-data character(s), including an optional check character, 4-a stop character and 5-a trailing quiet zone.

Bi-directional
Characteristic of some bar codes that allow decoding of the symbol regardless of whether the bar code is scanned in a forward or backward direction.

CCD
Charge-Coupled-Device, the solid state component found in a wide variety of products from simple scanners and fax machines, to highly sophisticated devices, like linear imagers, video cameras, and digital cameras.

Close Range
Contact to 5 inches (12.7 cm)

CMOS
Complementary Metal Oxide Semiconductor (pronounced see-moss). CMOS is a widely used type of semiconductor. CMOS semiconductors use both NMOS (negative polarity) and PMOS (positive polarity) circuits. Since only one of the circuit types is on at any given time, CMOS chips require less power than chips using just one type of transistor. This makes them particularly attractive for use in battery-powered devices, such as portable computers.

Long Range
2 feet (61 cm) to 35 feet (11 meters)

Laser
Light Amplification by Stimulated Emission of Radiation. Laser scanners read bar codes with a laser beam in conjunction with oscillating mirrors to automatically move the beam back and forth across the symbol.

Linear Imaging
Linear imagers are solid state scanners which use a charge-coupled-device (CCD) as their underlying technology. Linear imagers have generally better performance and reliability at a lower price than laser scanners.

LED
Light Emitting Diodes are special diodes that emit light when connected in a circuit. They are frequently used as "pilot" lights in electronic appliances to indicate whether the circuit is closed or not.

Matrix Codes
An arrangement of regular polygon shaped cells where the center to center distance of adjacent elements is uniform. The arrangement of the elements represents data or symbology functions. Matrix symbols may include recognition patterns that do not follow the same rule as the other elements within the symbol.

RFID
Radio Frequency IDentification. The use of radio frequency signals to provide automatic identification of items. RFID uses a reader (or interrogator) and special RFID tags that can be read and written to hundreds of times.

Standard Range
2-9 inches (5-23 cm).

Stacked Code
A long, multi-row symbol that is broken into sections, which are stacked upon another in a fashion similar to sentences in a paragraph.

Symbology
Bar code language, i.e. Code39, UPC, EAN, including linear, stacked matrix and matrix bar codes.

Two-dimensional Symbology
A machine-readable symbol composed of rows of encrypted data arranged in a rectangular or square pattern. The rows of data may be composed of bar code strips, "stacked" to form the two-dimensional block pattern or arranged as a checkerboard "matrix" of typically square elements.

X-dimension
The nominal dimension of the narrow bars and spaces in linear and 2D stacked codes. In 2D matrix symbols, the X-dimension is the height and width dimension of the smallest element because each module is square, except for MaxiCode modules, which are hexagonal.

GUIDE TO SCANNING TECHNOLOGIES

Intermec
expect MORE™

North America
Corporate Headquarters
6001 36th Avenue West
Everett, Washington 98203
tel: 425.348.2600
fax: 425.355.9551

Systems & Solutions
550 2nd Street S.E.
Cedar Rapids, Iowa 52401
tel: 319.369.3100
fax: 319.369.3453

Media Supplies
9290 Le Saint Drive
Fairfield, Ohio 45014
tel: 513.874.5882
fax: 513.874.8487

Canada
7065 Tranmere Drive
Mississauga, Ontario
L5S 1M2 Canada
tel: 905.673.9333
fax: 905.673.3974

Europe/ Middle East & Africa Headquarters
Sovereign House
Vastern Road
Reading RG1 8BT
United Kingdom
tel: 44.118.987.9400
fax: 44.118.987.9401

Asia
Asia Regional Office
25-16 International Plaza
10 Anson Road
Singapore 079903
tel: 65.6324.8391
fax: 65.6324.8393

Australia
Level 7, 200 Pacific Highway
Crows Nest, NSW 2065
Australia
tel: 61.2.9492.4400
fax: 61.2.9954.6300

South America & Mexico
Latin America Headquarters
17921 B Skypark Circle
Irvine, California 92614
tel: 949.442.9393
fax: 949.757.1687

Intermec South America Ltda.
Rua Arandu 1544-15 andar
Edifício Itavera
Brooklin Novo 04562-031
Sao Paulo, SP
Brazil
tel: 55.11.5501.2070

Mexico
Tamaulipas 141, Primero Piso
06140 Mexico, D.F.
tel: 525.55.211.1919
fax: 525.55.211.8121

Worldwide Fax Document Retrieval Service
800.755.5505
(North America Only)
tel: 650.556.8447

Internet
www.intermec.com

Sales
800.347.2636
(toll free in N.A.)
tel: 425.348.2726

Service and Support
800.755.5505
(toll free in N.A.)
tel: 425.356.1799

Intermec

Intermec ScanPlus 1800 and 1802 Bar Code Scanners Now Support RSS Bar Codes

EVERETT, Wash., July 3, 2002 Intermec Technologies Corp. today announced that its popular ScanPlus 1800 family of scanners now support Reduced Space Symbology®, or RSS, bar codes. The new codes, developed by the EAN International and the Uniform Code Council Inc., currently include seven variations. New ScanPlus 1800 and 1802 scanners support all linear versions of the RSS symbology; support for composite codes will be added later this year. Current owners of ScanPlus 1800 and ScanPlus 1802 scanners can upgrade their units with a free software upgrade, downloadable from the Intermec Web site.

Reduced Space Symbology is an exciting development that allows retailers to use bar code technology to track and manage more items, said Intermec Director Dan Bodnar. By adding RSS functionality to Intermec s two most popular retail handheld scanners, our retail customers can immediately begin to use these new codes in their point of sale terminals and computers.

The ScanPlus 1800 and cordless 1802 are high-performance, compact, and lightweight handheld scanners designed for retail, healthcare and light industrial use. The 1800 can easily be configured to work with virtually any PC, cash register or terminal. The scanners are available with either a laser or linear imaging scan engine.

Background: Reduced Space Symbology
Reduced Space Symbology is a family of linear codes capable of encoding the 14-digit EAN/UCC Global Trade Item Number (GTIN) in a very small space. It also allows additional information, such as variable weights and measures or expiration dates, to be included in a limited space. The four versions of the symbology currently supported by ScanPlus 1800 and 1802 are:

RSS-14® is a compact linear symbol that encodes the full 14-digit GTIN. It also can be linked with a two-dimensional symbol carrying supplementary information and can be scanned omnidirectionally.

RSS-14 Stackedalso encodes a 14-digit GTIN, but in two stacked segments. This allows optimal use of the space available. RSS-14 Stacked has two versions: a truncated version used for small item marking applications and a taller version designed to be read by omnidirectional scanners.

RSS-14 Limited"! encodes 14-digits, but the first digit (indicator) must have the value of either 1 or 0, so it cannot encode the full range of UCC/EAN-14 numbers. It cannot be scanned omnidirectionally.

RSS Expanded"! encodes up to 74 numeric or 41 alphabetic characters. The symbol encodes the GTIN or another EAN/UCC identification number plus additional data as required. It can be scanned omnidirectionally.

RSS support is available now on all new 1800 and 1802 VT scanners. Customers with existing scanners can add the capability with a simple Flash upgrade to the device s firmware. Contact an Intermec representative or partner for more information on upgrades.

About Intermec
Intermec Technologies Corp., a UNOVA Inc. (NYSE:UNA) company, has been named Microsoft s OEM Embedded Partner of the Year. Intermec is a leader in global supply chain solutions and in the development, manufacture and integration of wired and wireless automated data collection, Intellitag® RFID (radio frequency identification) and mobile computing systems. The

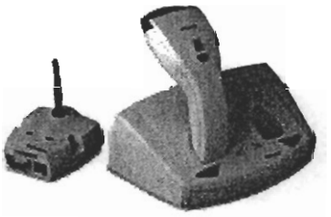
company s products and services are used by customers in many industries to improve productivity, quality and responsiveness of business operations, from supply chain management and enterprise resource planning to field sales and service.

To learn more about how companies can benefit from Intermec s supply chain technologies, contact Intermec Technologies Corp., 6001 36th Ave. West, Everett, WA 98203-9280 USA; telephone 800-347-2636; or visit Intermec's web site at www.intermec.com. To learn more about UNOVA, visit www.unova.com.

Intermec

ScanPlus® 1802 Vista Cordless

Features



- Patented Vista™ quality scanning
- Cable free design for exceptional mobility and safety
- Range up to 50 feet (15 meters) from base station
- Multiple scanners can interface with a single base station
- 10,000 scans for a full day's use
- Bi-directional communication
- Completely integrated, ergonomic design and lightweight for easy use
- More than 1500 interfaces available
- Use of EasySet® setup software (for Windows) for quick and easy installation
- PDF 417 decoding with manual raster, and new Reduced Space Symbology (RSS) decoding

With its innovative design, the ScanPlus 1802 Vista handheld bar code scanner brings cordless technology to the healthcare, retail, office and light industrial environments. The ScanPlus 1802 Vista is appropriate for a variety of applications including patient billing, patient tracking, medicine dispensing, UPN compliance, price management, asset/document tracking, and PC fabrication and assembly. Scanning is easier when all bar codes are within your reach and there is no cable to become entangled or damaged. The ScanPlus 1802 Vista scanner offers the exceptional speed and performance of Intermec's patented Vista technology for fast reading and decoding of all bar codes, including damaged or very small codes.

The ScanPlus 1802 Vista is highly flexible; it is able to read PDF-417 and connect with more than 1500 interfaces. Furthermore, the scanner's unique ergonomic shape and lightweight (8.2 oz/232 g.) makes it comfortable to hold and use. With a radio range up to 50 feet (15 meters) and a battery capacity to 10,000 scans, the ScanPlus 1802 Vista scanner offers outstanding autonomy. The NiMH battery pack is quickly recharged by the advanced two bay high-speed charger for a full day of intensive use. As with most Intermec scanners, the ScanPlus 1802 Vista is compatible with EasySet setup software for the fastest on line or off line configuration.

Data transmission is very efficient with narrow band technology (433 MHz and 908 MHz). The two-way communication system between the scanner and base station allows real time transmission and acknowledgement to ensure reliability.

The MicroBar 9735 base station can interface with up to 5 cordless scanners as well as other input devices. Moreover, it offers extremely advanced data formatting capabilities. Engineered with the user in mind, the ScanPlus1802 Vista scanner is associated to its base simply by reading the Association Bar Code on the MicroBar 9735. To work in another area, a user needs only to scan the bar code on the corresponding base. The capability of interfacing multiple scanners to a unique base provides an extremely cost efficient solution.

Experience the ultimate in freedom and autonomy with Intermec's ScanPlus 1802 Vista.

Product Contents

A complete kit includes a ScanPlus 1802 Vista scanner, a battery pack, an interface cable, a MicroBar 9735 base station, EasySet configuration software, an Operator's Guide, and a Getting

Started Guide.

Physical Characteristics
Length: 3.35 in / 8.5 cm
Width at handle: 1.3 in / 3.3 cm
Width at head: 2.5 in / 6.4 cm
Weight: 8.2 oz (232 g) incl. battery pack

Power
Voltage: MicroBar 9735 - +5VDC (+/- 5%)
Typical Current Draw: N/A (if battery)
Battery Type: NiMH 3.6V / 600mA
Battery Life: 10,000 scans
Recharging Time: 3 hours maximum

Terminal Connectivity
Can connect to hundreds of terminals, including USB, RS 232, keyboard emulation, OlePOS, IBM, NCR, HP 700/xx, DEC VT, Wyse. For detailed information, use the terminal selector within EasySet software (available FOC).

Bar Code Symbologies
1D codes: UPC (E&A), EAN, Code 39, Interleaved Matrix, Industrial & Standard 2 of 5, Code 128, UCC EAN 128, Codabar, Code 93, ISBN, MSI, Plessey, Telepen
2D stacked codes: PDF 417, CodaBlock A,F

Scanning Performance
Scan rate: 270 scan/s maximum
Minimum X dimension: 2 mils / 0.05 mm on Code 39
Depth of field: 0 - 13 in (0 - 33 cm)
Scan angles: 48°
PCR: 25% min.
Code width: 7 in / 18 cm
Skew: +/- 35°
Pitch: +/- 35°
Optical Parameter: 645 nm visible red LEDs

Scan Range
2 mil / 0.05 mm: 3.3 in / 8.5 cm max (Code 39 only)
3 mil / 0.08 mm: 4.3 in / 11 cm max (Code 39 only)
5 mil / 0.13 mm: 4.9 in / 12.5 cm max
7.5 mil / 0.19 mm: 5.6 in / 14.2 cm max
10 mil / 0.25 mm: 6.2 in / 15.7 cm max
15 mil / 0.38 mm: 7.5 in / 19.1 cm max
20 mil / 0.5 mm: 8.7 in / 22 cm max
40 mil / 1.0 mm: 13 in / 33 cm max
100% UPC/EAN: 7.1 in / 18 cm max

Radio Characteristics
Frequency Band: 433MHz & 908MHz
Radio Type: bi-directional narrow band
Radio Power Output: 1mW (900MHz) & 10mW (433 MHz)
Radio Data Rate: 9600 bds
Channels: 5 (433MHz) & 10 (900 MHz)
Range: up to 65 ft (20 m)
Features: up to 5 scanners linked to a MicroBar 9735 base station

Processor
Custom chip (ASIC including DSP processor) for fast signal processing and decoding.

Flash memory

Accessories
Battery charger
Spare battery

Environment
Operating Temperature: 32° – 104°F (0 – 40°C)
Storage Temperature: -4° – 131°F (-20° – 55°C)
Recharging Temperature: >41°F (>5°C)
Humidity: 10% – 90% (non-condensing)
Drop Survival: withstands multiple 3.2 feet (1 meter) drops to concrete

Advanced Data Formatting (MicroBar 9735)
Pre- and post-ambules (20 characters + 2 characters for AIM symbology identifiers), port address (15 characters), masking and re-ordering function.

Regulatory Approvals
900 MHz: UL listed, cUL listed, UL 1950
433 MHz: TUV-Rheinland GS licensed EN60950, CE marked
Radio approvals: US version: FCC Part 15.249; European version: EN 300 220 Intermec reserves the right to make changes without notice to any products herein for any reason at any time, including but not limited to improving the reliability, form, fit, function or design. Please contact Intermec for current price list and availability.